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Minutes of Life Support Conference

5-6 December 1972

Davis-Monthan AFB, Arizona

Attendees:

[Redacted]

1. Introduction and Opening Remarks:

[Redacted] the Group Chairman, opened the meeting with a welcoming address and introduction of the members. At the request of the director of the Air Science Museum, the group was asked to contribute as many items as possible for the pressure suit historical display for the Smithsonian Institution. Questionnaires were passed out to assist with the above. [Redacted] closed the data bank collection agenda item discussed at the last meeting and stated that it did not appear to be a worthwhile effort.

2. Senior-Year Program Presentation:

[Redacted] presented a classified briefing on the Senior-Year Programs with special emphasis on the [Redacted] Project.

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3. Norton AFB Life Sciences:

25X1 [] of the Life Sciences Division at Norton AFB presented current statistical information for the following areas:

a. SEA Escape and Evasion Experiences from 1 Jan 63 to 31 Dec 71 -- recapitulation of this information will be available in the field by mid December 72.

b. This year's non-combat ejection experiences through Oct 72 -- thus far the 74% survival rate is the worst since the advent of the ejection seat. Continued education with emphasis on early decisions to eject must be presented to aircrew members at every opportunity.

c. Reporting of Decompression Sickness -- correct reporting of this disease is absolutely necessary for continued study and research. Do not hesitate to request information on this or related areas such as number of cabin pressurization losses, hypoxia incidents, ejections, etc.

d. A discussion followed regarding the importance of complete data for parasail training and how this data can be used to convince commanders of the necessity for such training.

e. Inflatable lumbar pads were discussed and the need for an automatic pressure relief valve was brought up.

4. Automatic Seat-Kit Deployment:

25X1 This briefing was presented by []
25X1 [] project engineer. The [] system as
25X1 presented at the last meeting has been refined and up-
dated into a terrain sensing device under research by
[] This system will
significantly increase the operational range to between
500 and 100 feet. Final test reports are anticipated
in August 1973.

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5. The Life Support SPO at ASD:

25X1 [redacted] briefed the group on the Life Support SPO of the Aeronautical Systems Division. Their mission is to provide the best possible life support services and equipment. The definitions and responsibilities of these man-machine interface endeavors are contained in AFR 800-12 and the "Life Support Systems Handbook."

25X1 [redacted] presented program endeavor reports for the following subjects:

- a. The B-1 program.
- b. Advanced Concept Ejection Seat (ACES).
- c. Fire-retarding materials -- PBI, NomexII, and leather being treated with a magnesium solution.
- d. Oxygen candle systems.
- e. Fire-retarding parachute canopy.
- f. Battery-powered heated gloves.
- g. Electrically-charged aircraft escape systems.
- h. Automatically-inflated life preservers.
- i. Air-aspiration inflation systems.
- j. Water-ventilation garments.

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6. Omni-Environmental Improved Helmet Assembly:

25X1 [] of the David Clark Company presented the new improved helmet assembly. The briefing was divided into aircrew improvements and those applicable to field maintenance:

a. Aircrew improvements -- in spite of having to move the oxygen regulator back to the helmet to increase downward visibility, improvements were realized in the area of mobility and comfort; thrust bearings in the neck ring reduced torque and increased ease of head movement; conventional neck ring was replaced by soft interface thus saving one pound of weight; "Bailer Bar" again replaced locking mechanism on left side of helmet for better control of head movement; head liner redesign increased comfort and ventilation; a more positive take-up mechanism was incorporated; soft neck interface provides for more ease of don/doff; and the overall helmet weight is now 6 1/2 pounds instead of 8.

b. Field Maintenance improvements - visor and sunshade now operate independently which considerably improves maintenance; oxygen regulator, hoses, and comm leads can be replaced externally; seal is now on visor instead of hardshell; neck ring maintenance is now accomplished by removal of a holding plate; removable face barrier will eliminate the use of adhesives and cure times; and a simplified feeding port will cut down on trouble shooting and maintenance.

7. Pressure Suit Problems and Incident:

25X1 [] presented a briefing on the following pressure suit problems and physiological incident:

a. Feeding problem -- presently there are only three types of tube foods available; increased varieties must be made available if we are to keep the pilots from opening their visors in flight.

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b. UCD problem -- the urine collection device (UCD) is presently undergoing studies to determine if the reservoir needs to be enlarged.

c. Incident -- recently a pilot experienced visual difficulties while at extremely high altitude; he was a test pilot using the MC-3A partial pressure suit; investigation revealed no medical nor equipment problems; preliminary reports indicate that no medical basis could be determined to show that the pilot suffered from hypoxia or any other illness.

8. Pressure-Suit Storage:

25X1 [] presented the results of tests and analysis performed on pressure suits to determine proper storage techniques. Tests were performed on a 1967 901-J suit stored under ideal conditions as opposed to the adverse conditions under which a 1966 901-H suit was stored. Structural leak tests and laboratory analysis could produce only slight differences. Through test results, it was recommended that suits be stored in the cleanest possible manner, air conditioning be used when available, suits be kept dry, and most important of all, assemblies be kept from heat and direct sunlight. Also it was recommended that all seals and gaskets be replaced prior to restoring to operational service.

9. Future TAC Pressure-Suit Programs:

25X1 [] recently attended a planning conference for TAC's future pressure suit requirements. He presented the advantages/disadvantages of the full, partial, and CSU-4/P pressure suits. Since the maximum altitude involved will be 60,000 feet, a "get-down" garment appears to be more desirable than a mission-completion suit. Helmets, masks (70 mmHg oxygen pressure), and vests are being evaluated for this purpose. Also mentioned was the fact that very few missions would be flown at high altitude; most would be low-altitude profiles.

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10. USAF Full-Pressure Suit Depot:

25X1 [] presented a briefing on the Tyndall AFB Physiological Training Unit. Special emphasis was given to their full-pressure suit depot responsibilities. They are the sole Air Force source for obtaining operational pressure suits. Because of the great number of agencies involved with pressure-suit requests, 25X1 [] pointed out that all requests originating in a MAJCOM or agency that does not possess its own training capability would have to be routed to Headquarters USAF/SGPA.

11. SAC Physiological Training Coordinator:

25X1 [] commented on the following items:

a. The proposed oversea's project for Davis-Monthan based aircraft is scheduled to start in April 73. Personnel are being assigned to this project on a PCS basis. In addition, if the project is to last more than 30 days, a permanent PSD facility must be constructed.

b. Major General Johnson signed a "Certificate of Urgency" during the first part of December to release funds for construction of an Altitude Chamber Building at Davis-Monthan AFB. This request is presently at Hq's USAF.

c. Pressure-Suit water survival training is now available at Homestead AFB. A three-day course has been coordinated for this purpose. For pilots who have all ready attended an accredited school, there is a one-day parasail course.

12. Poly-carbonate Visor:

Research continues to come up with a hard coating for increased durability. A hard coating as well as a conductive coating appears to be feasible. NASA testing continues.

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13. Pressure Sealing Closure:

NASA continues studies in this area. Final evaluation will be in the EVA program and should be forthcoming shortly.

14. Tree-Lowering Device Problems:

25X1 There are two problem areas for this device. The SR-71 aircraft have this item stowed in the seat kit which could make it relatively inaccessible. A different problem exists for U-2C aircraft. Cockpit space is so critical that if this device is used, full aft positioning of the yoke is not possible. The item has been written up in an HR and [] will follow its progress. This device has been removed from all parachutes for local area training missions.

15. Cooling and Ventilation:

25X1 [] is working on an improved bladder for the S-1010 glove assembly and has designed finger extensions for more thorough ventilation.

Another area of improved ventilation is in the low-altitude torso harness. [] personnel have evaluated it and found that the system is most acceptable.

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16. Low-Altitude Regulator Mounted on Right Shoulder:

25X1 [] has accomplished this relocation on the low-altitude harness to prevent interference with aircraft yoke. Davis-Monthan AFB is in the process of evaluating this item for their use.

17. Water-Activated Seat Kit and Life Raft:

25X1 This proposed modification was submitted by Lockheed to []. He rejected the idea on the premise that an automatically activated seat kit was presently under evaluation and appeared to be an acceptable method of accomplishing the desired automatic features.

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18. New Agenda Item -- Shark Bag:

25X1 [] presented a briefing on the "Shark Bag" as designed by Dr. C. Scott Johnson, U. S. Navy. Its dimensions packaged are 6 inches x 7 inches x 2 inches and it weighs 4 pounds. Its main shark deterrent feature is the flat black, low-contrast color.

25X1 [] will procure one and continue this discussion at the next meeting.

19. 22-Caliber Survival Weapon:

This weapon was again shown by [] In addition to several types of 22 ammo, it will now accommodate rocket flares as well as pen-gun flares. A safety device has been incorporated for reloading. Since there are no Air Force nor Government procurements available, the present cost is somewhat prohibitive.

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20. Next Meeting:

25X1 [] volunteered Tyndall AFB as a possible consideration. No decision was made. [] will inform the group when a final decision is reached.

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